Observations
A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

OCTOBER 2004
(VOLUME 12, NO. 10)
Visit our website at www.ccas.us

Total Eclipse!

What: A total eclipse of the Moon

When: Wednesday October 27, 2003

Where: visible from all of Chester County

Equipment needed: None. Just your eyes.

Times:

Partial eclipse begins: 9:14 p.m. EDT

Total eclipse begins: 10:23 p.m. EDT

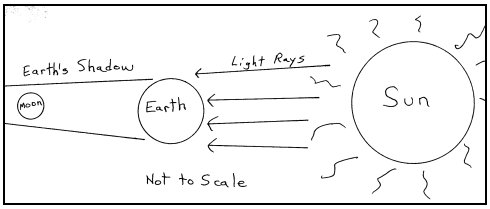
Total eclipse ends: 11:45 p.m. EDT

Partial eclipse ends: 12:54 a.m. EDT on 10/28/2004

Next total lunar eclipse: March 2007

Eclipse Notes

The eclipse will begin with the Full Moon high in the eastern sky. The Moon will be passing through the Earth's shadow in space (Earth has a shadow caused by the Sun just like the shadow you have on a sunny day). The Moon will be passing somewhat close to one edge of the Earth's shadow, so the darkening and coloration will appear to be uneven from one side of the Moon to the other, much like you see in the above image. The reddish color is caused by some sunlight that is bent by the Earth's atmosphere, and thus makes it around the edge of the Earth. The light toward the blue end of the spectrum is scattered more by the Earth's atmosphere so it's mostly reddish light that gets through. The darkness of lunar eclipses varies from one eclipse to another; this seems to be related to the amount of aerosols in the Earth's atmosphere (from pollutants, volcanic eruptions, large forest fires, etc.). An eclipse is fun to watch through a telescope, as you watch the edge of the Earth's shadow moving across the lunar terrain, engulfing one feature after another.

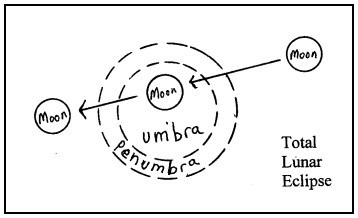


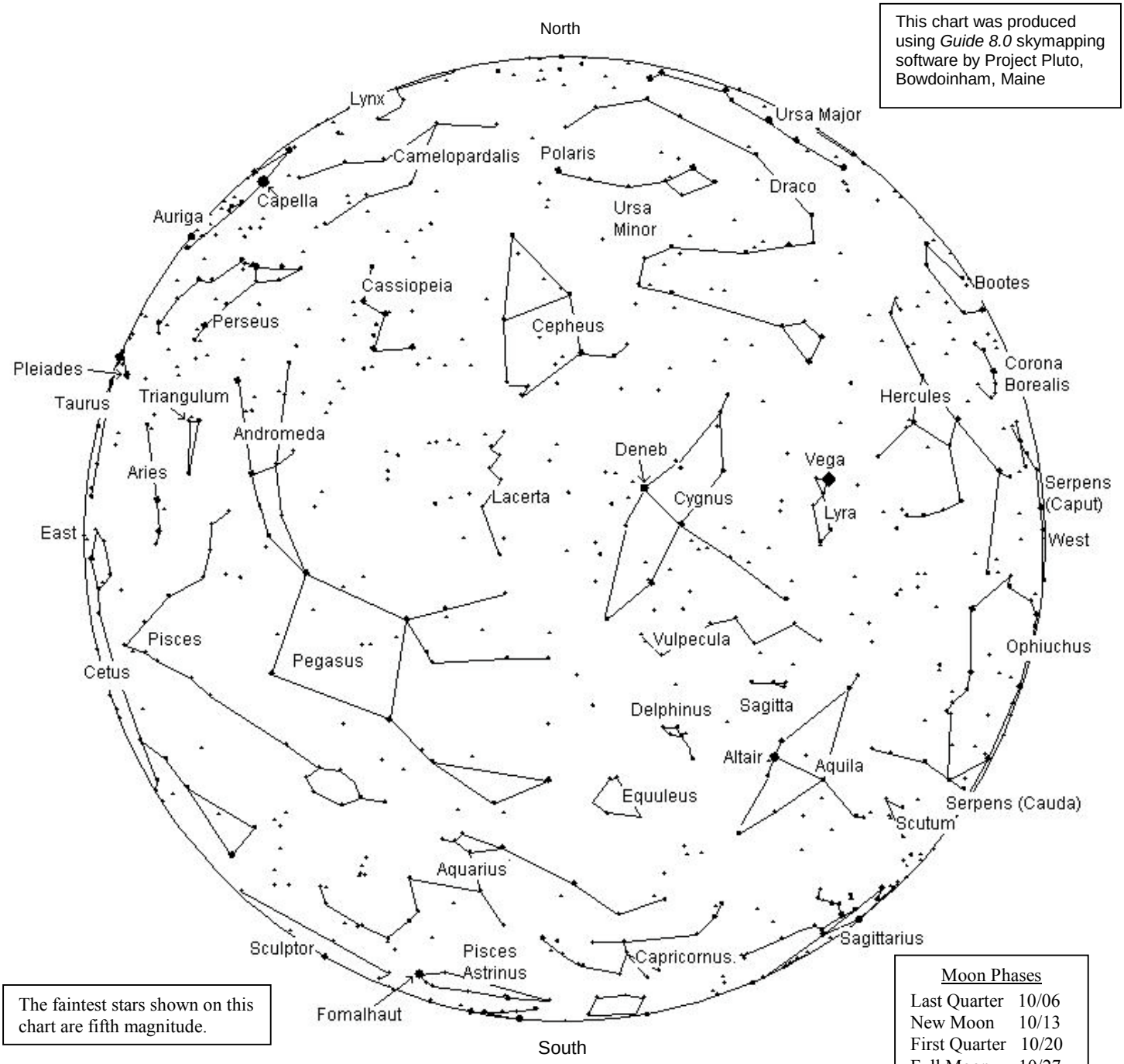
Diagrams showing a total lunar eclipse

Left: as seen from the side

Right: as seen from the Earth

(the umbra is the darkest part of the Earth's shadow)





The sky over Chester County
October 15, 2004 at 9:00 p.m. EDT

The Planets

Mercury is very low in the evening sky, and hard to find.

Venus is in the morning sky, rising as much as three hours before the Sun. You can't miss it; it's the brightest "star" in the sky after 3:30 a.m. or so when it rises.

Mars is behind the Sun for most of the month, but by the 31st it will be very low in the morning sky.

Jupiter is in the morning sky this month, getting higher before dawn each day.

Saturn is rising in the east by midnight in October. By the 31st, when we switch to Standard Time, Saturn will be rising by 10 p.m. our time.

Uranus is in the evening sky, in Aquarius. Uranus is well placed for telescopic viewing in the evening hours.

Neptune is also in the evening sky, in Capricornus.

Pluto is in the evening sky, but is now too close to the Sun to find.

Other Notes: The annual Orionid meteor shower peaks on the morning of October 21, 2004.

Daylight Savings Time ends on October 31, 2004: Turn clocks back one hour.

CCAS October Meeting

DATE: **Tuesday October 11, 2003**
TIME: 7:30 p.m. EDT
PLACE: Department of Geology and Astronomy Lecture Room (Room 113 – Boucher Building) West Chester University
LOCATION: South Church Street West Chester, PA

Our guest speaker will be CCAS member Dr. Jeff Goldader. Jeff is also a professional astronomer, and has served on the staff of the Space Telescope Science Institute (which runs the Hubble Space Telescope). Jeff will deliver an illustrated talk called "Through the Eyes of Hubble." This talk was originally planned for the "Save the Stars" star party hosted by the Pennsylvania Outdoor Lighting Council (POLC) last May 7. Unfortunately that event was cancelled, so now we get to enjoy Jeff's talk for the first time. Jeff will give a "best-of" picture show from the nearest planets to the farthest galaxies. He will also update the current status of Hubble and discuss the chance of a repair or rescue mission.

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CCAS October Observing Session

The next CCAS Observing Session will be at the Brandywine Valley Association's Myrick Conservancy Center (see map on a later page) on Friday October 15, 2004 starting at sunset; or earlier, if you can get there earlier. If it's too cloudy on Friday, then the Observing Session will be on Saturday October 16, 2004. At the observing sessions, there will be help available to set up and use your telescopes. If you're having trouble using your telescope, or finding your way around the sky, come on out and get some assistance. All members are invited whether they have a telescope or not. Telescope owners are always glad to share the view through their telescope. CCAS Observing Sessions are always free of charge.

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CCAS Backyard Observing Class

The fall class, *Backyard Observing*, concentrates on actual observing: how to find things in the night sky, what's there to see, etc. Each class session centers on some specific constellations visible that night, as well as lunar, solar, and planetary observing. The class consists of 7 one-hour sessions, on alternate Mondays, starting with September 20. This is the remaining schedule:

Oct. 4	Pegasus and Andromeda
Oct. 18	Lunar and Solar Observing; the Zodiac
Nov. 1	Cassiopeia and Cepheus
Nov. 15	Perseus
Nov. 29	Taurus
Dec. 13	What can I see with my telescope?

All classes are held at the West Goshen Township Building at the intersection of Paoli Pike and Five Points Road, just outside West Chester. Classes begin at 7:00 p.m. (ET).

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Help Us To Keep in Touch…And Save Money, Too!

by Bob Popovich

Receiving CCAS correspondence by email allows you to have the latest award-winning newsletter and to be informed about special activities—all in the twinkling of an eye! You also get to see the newsletter (and the pictures therein) in full color. It also saves all of us the cost of postage and printing. If you have email and are not now receiving the newsletter in this manner, please send a note to Bob Popovich at b2n2@aol.com.

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Treasurer's Report by Bob Popovich

August 2004 Financial Summary

Beginning Balance	$1,295
Deposits	25
Disbursements	81
Ending Balance	$1,239

Membership Renewals Due

10/2004:	Hogate
	Liberati
	Smith
	Volcheck
11/2004:	Athens
	Buczynski
	Hepler
	Okpaku
	Zimmer
12/2004:	Limeburner

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Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

The current dues amounts are listed in the *CCAS Information Directory* on a later page in this newsletter.

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NASA's Space Place

Hunting Gravitational Waves: Space Technology 7

By Patrick L. Barry and Dr. Tony Phillips

Among the mind-blowing implications of Einstein's general theory of relativity, direct verification is still missing for at least one: gravitational waves. When massive objects like black holes move, they ought to create distortions in space-time, and these distortions should spread and propagate as waves—waves in the fabric of space-time itself.

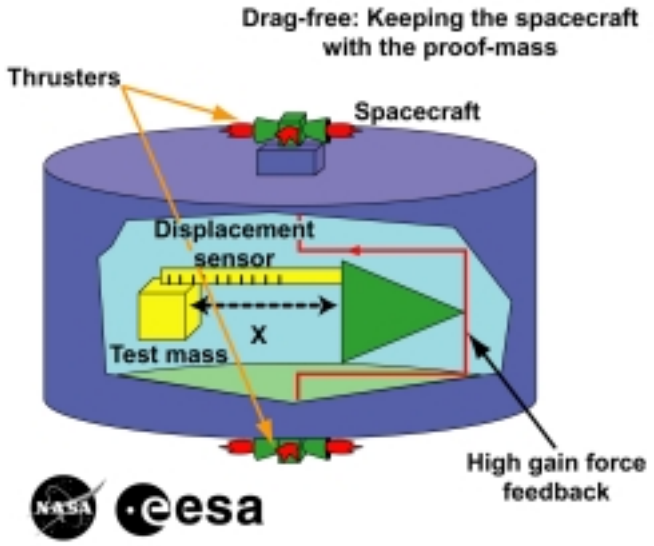
If these waves do exist, they would offer astronomers a penetrating view of events such as the birth of the Universe and the spiraling collisions of giant black holes. The trick is building a gravitational wave detector, and that's not easy.

Ironically, the gravitational waves spawned by these exceedingly violent events are vanishingly feeble. Gravitational waves exert a varying tug on objects, but this tug is so weak that detecting it requires a device of extraordinary sensitivity and a way to shield that device from all other disturbances.

Enter Space Technology 7 (ST-7). This mission, a partnership between NASA's New Millennium Program and the European Space Agency (ESA), will place a satellite into a special orbit around the Sun where the pull of the Earth's and Sun's gravities balance. But even the minute outside forces that remain -- such as pressure from sunlight -- could interfere with a search for gravitational waves.

To make the satellite virtually disturbance-free, ST-7 will test an experimental technology that counteracts outside forces. This system, called the Disturbance Reduction System (DRS), is so exquisitely sensitive that it can maintain the satellite's path within about a nanometer (millionth of a millimeter) of an undisturbed elliptical orbit.

DRS works by letting two small (4 cm) cubes float freely in the belly of the satellite. The satellite itself shields the cubes from outside forces, so the cubes will naturally follow an undisturbed orbit. The satellite can then adjust its own flight path to match that of the cubes using high-precision ion thrusters. Making the masses cube-shaped lets DRS sense deviations in all 6 directions (3 linear, 3 angular).



Space Technology 7 will test a technology to be used in detecting gravitational waves in space.

ST-7 is scheduled to fly in 2008, but it's a test mission; it won't search for gravitational waves. That final goal will be achieved by the NASA/ESA LISA mission (Laser Interferometer Space Antenna), which is expected to launch in 2011. LISA will use the DRS technology tested by ST-7 to create the ultra-stable satellite platforms it needs to successfully detect gravitational waves.

If ST-7 and LISA succeed, they'll confirm Einstein (again) and delight astronomers with a new tool for exploring the Universe.

Read more about ST-7 at http://nmp.jpl.nasa.gov/st7 . For kids in a classroom setting, check out the "Dampen that Drift!" article at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml .

The preceding article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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Calendar Notes

October 4, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EDT
October 12, 2004 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EDT
October 15/16, 2004 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
October 18, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EDT
October 27, 2004 (Wednesday)	**Total Eclipse of the Moon** Completely visible from all of Chester County Starts at 9:14 p.m. EDT
November 1, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EST
November 9, 2004 (Tuesday)	CCAS Meeting Location: West Chester University 7:30 p.m. EST
November 12/13, 2004 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
November 15, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EST
November 29, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EST
December 10/11, 2004 (Friday/Saturday)	CCAS Observing Session Location: BVA sunset
December 13, 2004 (Monday)	Backyard Observing class Location: West Goshen Twp. Bldg. 7:00 p.m. EST

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Newsletter Deadlines

These are the deadlines for submitting material for publication in the newsletter, through the December 2004 issue.

Issue	Deadline
November 2004	10/27/2004
December 2004	11/26/2004

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Join the Fight for Dark Skies!

You can help fight light pollution, conserve energy, and save the night sky for everyone to use and enjoy. Join the nonprofit International Dark-Sky Association (IDA) today. Individual memberships start at $30.00 for one year. Send to:

International Dark-Sky Association
3225 N. First Avenue
Tucson, AZ 85719-2103

Dark-Sky Website for PA

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their Website: http://home.epix.net/~ghonis/index.htm

Help Needed With Society's 20" Telescope

The Society's 20" telescope belongs to the whole Society; it is intended to be available for use by members at Observing Sessions, and even for short-term borrowing by Society members. The problem we have with implementing this policy is, simply put, lack of mobility. We need a member with a big enough truck or minivan, and preferably with the storage space at home for the telescope, to volunteer to be the telescope's "custodian" and "chauffeur." The custodian would of course be able to use the telescope whenever it wasn't out on loan. The biggest part of the telescope is the bottom part; it weighs a couple hundred pounds. We have wheels and handles that convert that piece into a large "wheelbarrow" for moving it, though, and ramps so it can be wheeled right into a vehicle. Ed Lurcott is willing to keep storing the telescope in his garage, if someone can volunteer to be the chauffeur, but not the custodian. If you can help, please call Ed Lurcott at (610) 436-0387. Thanks.

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Mission Update: Genesis Spacecraft

September 8 - The Genesis spacecraft, which was supposed to parachute to Earth and be snatched in midair by a helicopter, crashed into the Utah desert at over 190 mph when its parachute failed to deploy.

"Beep, beep!"

Cartoons by Vic Carlucci

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How dark is the Moon when fully eclipsed?

This can be measured with the naked eye, using the Danjon Scale of Brightness:

Value	Description
0	Very dark eclipse. Moon almost invisible, especially at mid-totality.
1	Dark eclipse, gray or brownish coloration; details can be distinguished only with difficulty.
2	Deep red or rust-colored eclipse, with a very dark central part in the umbra and the outer rim of the umbra relatively bright.
3	Brick-red eclipse, usually with a bright or yellow rim to the umbra.
4	Very bright copper-red or orange eclipse, with a bluish, very bright umbral rim.

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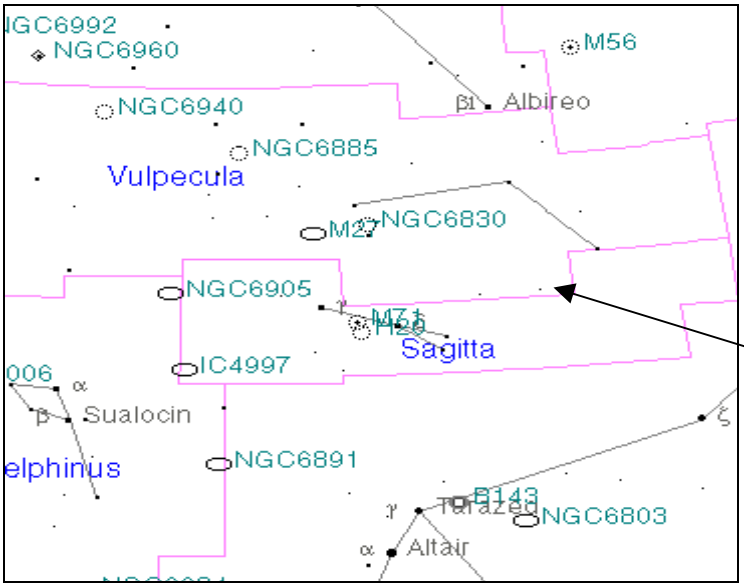
Astronomus

"A Foxy Little Constellation"

By Bob Popovich

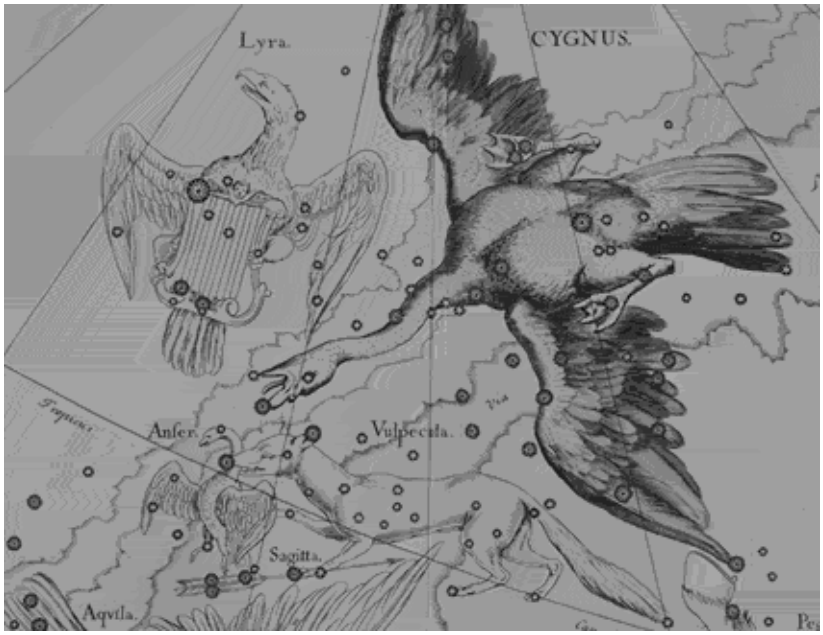
The focal point of the night sky through the summer and early autumn is, of course, the Summer Triangle. The tidy isosceles triangle formed by the α stars of Cygnus (Deneb), Lyra (Vega) and Aquila (Altair) draws our attention. And this attention is very much justified as the triangle overlays the Milky Way and contains a lifetime of enjoyable stargazing—Messier objects, multiple stars, clusters and asterisms—all cushioned against the soft Milky Way.

But nestled in the middle of this geometric skymark is an inconspicuous grouping of stars that Johann Hewelke deemed a constellation. Herr Hewelke, shown at right, is better known to us by the Latin version of his name—Johannus Hevelius. Looking at this faint collection of suns (4th magnitude+), he saw a bold little fox. He named it Vulpecula. Contemporary charts often depict the fox thus:



Collinder 399

I think we could agree that on two points: (1) it doesn't look like a fox and (2) it certainly looks anything but courageous. But notice below at what Hewelke placed in the fox's mouth[1]. The story is that Vulpecula is preparing to dine on Anser, the baby goose. Now look at Cygnus. Cygnus looks very angry about what it's seeing. Perhaps Anser isn't a baby goose, but a baby swan. Could it be Cygnus' own? In either case, it's kin and that fox has a lot of guts venturing so close to the ominous-looking swan.



[1] In the 1690 posthumously-published *Celestial Atlas*.

While we no longer retain the image of Vulpecula's supper, we have kept the name Anser as applying to α Vulpeculae.

Turning now to a spot just about half way between Albireo (β Cygni) and Altair (α Aquilae) we find the ever-delightful Collinder 399—known otherwise as Brocchi's Cluster or the "Coathanger Cluster".

This asterism is the antithesis of Vulpecula because it looks exactly like its name. The first time you see it you instantly recognize it and commit it to memory. Observe this with low power or binoculars—it is truly a gem of the summer triangle.

We call the Coathanger beautiful and it is. We also call it a cluster but it isn't. In reality, the stars of this "cluster" are only visually associated for our enjoyment. Ranging in distance from about 200 LY to over 1,100 LY, they are all taking their own separate paths through the cosmos. Some day in the distant future, the Coathanger will be no more…

Our foxy little constellation also has 3 New General Catalogue objects and 1 Messier object that of more of a challenge than the Coathanger, but still well worth the effort. They are identified on the chart above as NGC 6830, NGC 6885, NCG 6940 and M 27. Though hints of all 4 of these deep-sky objects are possible with 7x50s or higher, on most nights in this area you'll need a telescope to see them.

Lastly, our little fox's left ear is a fine double with a lovely color contrast. And remember that this is just a short hop from what might be the finest double in the sky—Albireo (in Cygnus).

Deceptively small and unassuming, our foxy little summer gem is a true winner. Just remember not to let him guard the hen house.

Next Time: The Less-Traveled Well-Traveled Road

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PHILOSOPHER TURNS ASTRONOMER

Cartoon by Nicholas La Para

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CCAS Information Directory

CCAS Lending Telescopes

Contact Kathy Buczynski to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Kathy's phone number is 610-436-0821.

CCAS Lending Library

Contact our Librarian, Linda Lurcott Fragale, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings. Linda's phone number is 610-269-1737.

Contributing to *Observations*

Contributions of articles relating to astronomy and space exploration are always welcome. If you have a computer, and an Internet connection, you can attach the file to an e-mail message and send it to **newsletter@ccas.us**

Or mail the contribution, typed or handwritten, to:

Jim Anderson
1249 West Kings Highway
Coatesville, PA 19320-1133

Get CCAS Newsletters via E-mail

You can receive the monthly newsletter by e-mail. All you need is a PC or Mac with an Internet e-mail connection. To get more information about how this works, send an e-mail request to Jim Anderson, the newsletter editor, at:

newsletter@ccas.us

CCAS A.L. Award Coordinators

These are the members to contact when you have completed your observing log for the Messier, Binocular Messier, Lunar, or Double Star Awards:

Messier (both): Jim Anderson
(610-857-4751)

Lunar: Ed Lurcott
(610-436-0387)

Double Star: Jim Anderson
(610-857-4751)

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "star nights" for school, scout, and other civic groups.

CCAS Executive Committee

For further information on membership or society activities you may call:

President: Mike Turco
(610) 399-3423

Vice Pres: Steve Limeburner
(610) 353-3986

Treasurer: Bob Popovich
(610) 363-8242

Secretary: Caitlin Grey
(610) 918-9049

ALCor and Newsletter: Jim Anderson
(610) 857-4751

Librarian: Linda Lurcott Fragale
(610) 269-1737

Observing: Ed Lurcott
(610) 436-0387

Education: Kathy Buczynski
(610) 436-0821

Public Relations: Vic Carlucci
(610) 458-7457

CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER.....$25/year
SENIOR MEMBER.....$10/year
STUDENT MEMBER..….....$ 5/year
JUNIOR MEMBER.....$ 5/year
FAMILY MEMBER.....$35/year

Membership Renewals

Check the date printed on the address label of this issue of *Observations*; "exp." appears in front of it, just after your name. If you are due to renew, you may send your renewal check made out to "Chester County Astronomical Society". Mail to:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Sky & Telescope Magazine Group Rates

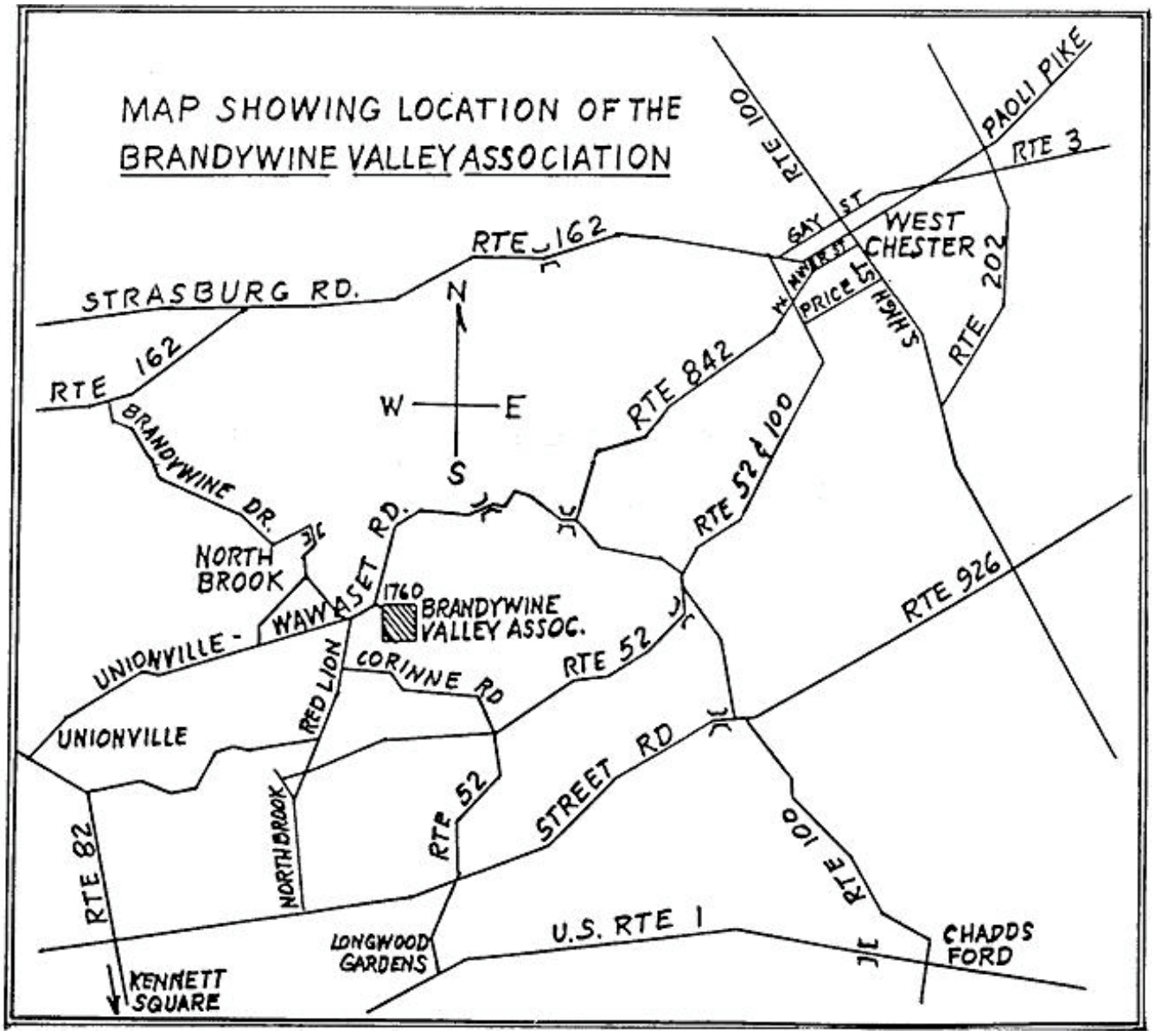
Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95** which is much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Make **sure** you make out the check to the **Chester County Astronomical Society** (do **not** make the check out to Sky Publishing, this messes things all up big time), note that it's for *Sky & Telescope*, and mail to Bob Popovich. Or you can bring it to the next Society meeting and give it to Bob there. **If you have any questions by all means call Bob first (610-363-8242).** Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

CCAS Website

Pete LaFrance is the Society's Webmaster. You can check our Website at:

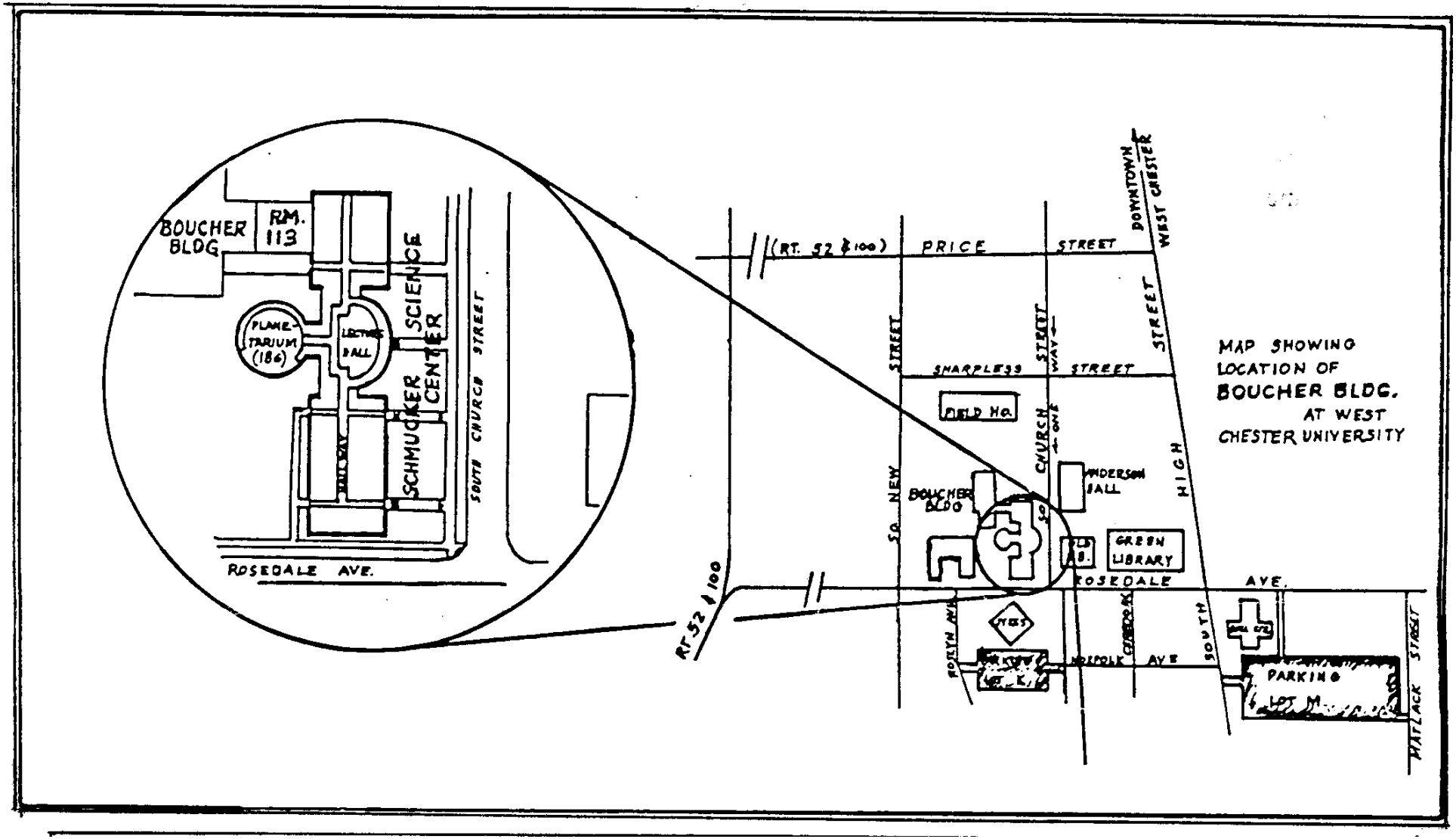
http://www.ccas.us/

Pete welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work; no copying copyrighted material! Give your contributions to Pete LaFrance (610-268-2616) or e-mail to plafrance@verizon .net **(new address)**



To get to the Myrick Conservation Center of the Brandywine Valley Association from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles.

To get to the observing site at the BVA property, turn off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go up the farm lane to the left; it's about 800 feet or so to the top of the hill. If you arrive after dark, please turn off your headlights and just use parking lights as you come up the hill (so you don't ruin other observers' night vision).



Parking is available behind Sykes Student Center on the south side of Rosedale Avenue (Parking Lot K), and behind the Bull Center at the corner of Rosedale Avenue and South High Street (Parking Lot M). If you arrive early enough, you may be able to get an on-street parking space along South Church Street, or along Rosedale Avenue. You can take the Matlack Street exit from Rt. 202 South; Matlack Street is shown on the map at the lower right corner with Rt. 202 off the map. If approaching West Chester from the south, using Rt. 202 North, you would continue straight on South High Street where Rt. 202 branches off to the right. This would bring you onto the map on South High Street near Parking Lot M, also in the lower right corner.